WHAT IS CLAIMED IS:

1. A method of determining an acceptance width for an alignment pattern detector that detects an alignment pattern in an image forming apparatus, comprising:

deriving a correlation between a line width of the alignment pattern, a writing density of the image forming apparatus, and the acceptance width of the alignment pattern detector; and

determining the acceptance width based on the correlation derived.

2. The method according to claim 1, wherein the correlation is derived experimentally.

3. The method according to claim 1, wherein the alignment pattern is formed on a medium by superposing a line image of a reference color and a line image of a sample color other than the reference color to make a plurality of lines as one patch, and arranging a plurality of patches in which a relative position between the line images of the two colors is continuously shifted by a predetermined amount.

4. The method according to claim 3, wherein the reference color is black.

5. The method according to claim 3, wherein the acceptance width is determined from following inequality

[acceptance width]>[line width]/(α×[writing density (dpi)]$^{-\beta}$).

6. The method according to claim 5, wherein

α is 5.0627, and

β is 0.5331.

7. The method according to claim 5, wherein the determining the acceptance width includes

setting a required line width from a maximum misalignment between the line images of the two colors, wherein the maximum misalignment is determined from output signals of the alignment pattern detector.

8. The method according to claim 7, wherein the required line width is equal to or more than twice the maximum misalignment.

9. A method of forming an alignment pattern for an image forming apparatus, comprising:

deriving a correlation between a line width of the alignment pattern, a writing density of the image forming apparatus, and an acceptance width of the alignment pattern detector;

determining the line width based on the correlation derived; and

forming the alignment pattern on a medium based on the line

width determined.

10. The method according to claim 9, wherein the correlation is derived experimentally.

11. The method according to claim 9, wherein
the correlation satisfies following inequality
[line width]<[acceptance width]×(α×[writing density (dpi)]$^{-\beta}$).

12. The method according to claim 11, wherein
α is 5.0627, and
β is 0.5331.

13. The method according to claim 9, wherein the line width is equal to or more than a maximum misalignment of the image forming apparatus.

14. The method according to claim 9, wherein the alignment pattern is formed by superposing a line image of a reference color and a line image of a sample color other than the reference color to make a plurality of lines as one patch, and arranging a plurality of patches in which a relative position between the line images of the two colors is continuously shifted by a predetermined amount.

15. The method according to claim 14, wherein the reference color is black.

16. An alignment pattern detecting sensor that detects an alignment pattern on a medium in an image forming apparatus, wherein

the alignment pattern is formed on a medium by superposing a line image of a reference color and a line image of a sample color other than the reference color, and

an acceptance width of the alignment pattern detecting sensor is determined from following inequality

[acceptance width]>[line width]/(α×[writing density (dpi)]$^{-\beta}$).

17. The alignment pattern detecting sensor according to claim 16, wherein

α is 5.0627, and

β is 0.5331.

18. The alignment pattern detecting sensor according to claim 16, wherein the alignment pattern is formed by superposing a line image of a reference color and a line image of a sample color other than the reference color to make a plurality of lines as one patch, and arranging a plurality of patches in which a relative position between the line images of the two colors is continuously shifted by a predetermined amount.

19. The alignment pattern detecting sensor according to claim 18, wherein the reference color is black.

20. The alignment pattern detecting sensor according to claim 16, wherein the acceptance width is determined based on a required line width satisfying the inequality, wherein the required line width is calculated from a maximum misalignment between the line images of the two colors.

21. The method according to claim 20, wherein the required line width is equal to or more than twice the maximum misalignment.

22. An image forming apparatus comprising:

an alignment pattern forming unit that forms an alignment pattern on a medium by superposing a line image of a reference color and a line image of a sample color other than the reference color;

an alignment pattern detector that detects the alignment pattern; and

a misalignment correcting unit that, based on output signals of the alignment pattern detector, determines an amount and a direction of a misalignment between the line images of the two colors, and corrects the misalignment, wherein

an acceptance width of the alignment pattern detector, a line width of the alignment pattern, and a writing density of the image forming apparatus satisfy following inequality

[acceptance width]>[line width]/(α×[writing density (dpi)]$^{-\beta}$).

23. The image forming apparatus according to claim 22, wherein
α is 5.0627, and
β is 0.5331.

24. The image forming apparatus according to claim 22, wherein the alignment pattern is formed by superposing a line image of a reference color and a line image of a sample color other than the reference color to make a plurality of lines as one patch, and arranging a plurality of patches in which a relative position between the line images of the two colors is continuously shifted by a predetermined amount.

25. The image forming apparatus according to claim 24, wherein the reference color is black.

26. The image forming apparatus according to claim 22, wherein the acceptance width is determined based on a required line width satisfying the inequality, wherein the required line width is calculated from a maximum misalignment between the line images of the two colors.

27. The image forming apparatus according to claim 26, wherein the required line width is equal to or more than twice the maximum misalignment.

28. The image forming apparatus according to claim 22, further comprising:

an image forming unit that includes a plurality of image carriers on each of which toner images of different colors are formed, and obtains a color image by sequentially superposing the toner images on a sheet-type recording medium carried on a transfer element.

29. The image forming apparatus according to claim 22, further comprising:

an image forming unit that includes a plurality of image carriers on each of which toner images of different colors are formed, and obtains a color image by sequentially superposing the toner images to a transfer element to form a combined color image, and batch-transferring the combined color image to a sheet-type recording medium.

30. The image forming apparatus according to claim 22, further comprising:

a plurality of image carriers on which toner images are formed; and

a transfer element to which the toner images are sequentially transferred, wherein

the reference color is set to black, and a toner image of the black is transferred lastly to be superposed on other toner images on the transfer element.

31. The image forming apparatus according to claim 30, wherein a lightness L* of the transfer element, on which the alignment pattern is formed, is equal to or less than 40.

32. The image forming apparatus according to claim 30, wherein a lightness L* of the transfer element, on which the alignment pattern is formed, is equal to or less than 20.

33. The image forming apparatus according to claim 22, wherein the misalignment correcting unit determines an amount and a direction of a misalignment between the line images of the two colors, by calculating an intersection point of two lines obtained by approximating curves in a graph of shift amount of the relative position versus signal output from the alignment pattern detector corresponding to the shift amount.

34. The image forming apparatus according to claim 33, further comprising a developing unit of a two-component developing type.

35. The image forming apparatus according to claim 22, further comprising an image forming unit that employs an ink jet system.

36. The image forming apparatus according to claim 22, wherein the alignment pattern is formed in such a manner that the line image of the reference color is lastly superposed on the transfer element of the image forming apparatus.

37. The image forming apparatus according to claim 22, wherein the alignment pattern detector includes a photodetector that detects either of a diffused light and a diffused component of a reflected light.

38. A computer program for determining an acceptance width for an alignment pattern detector that detects an alignment pattern in an image forming apparatus, the computer program making a computer execute:

deriving a correlation between a line width of the alignment pattern, a writing density of the image forming apparatus, and the acceptance width of the alignment pattern detector; and

determining the acceptance width based on the correlation derived.